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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,851	04/06/2001	Toshiaki Kuniyasu	Q63956	3185

7590

08/06/2003

SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC  
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WASHINGTON, DC 20037-3213

EXAMINER

MENEFFEE, JAMES A

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

09/826,851

Applicant(s)

KUNIYASU ET AL.

Examiner

James A. Menefee

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7, 18-21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 18-21 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

In response to the amendment filed 13 June 2003, claims 3 and 5 are amended. Claims 1-7, 18-21, and 23 are pending.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-7 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements. The claims are claiming semiconductor lasers, but there is nothing in the claims to suggest that any lasing may occur. Structure must be added so that the device may properly function as a laser. For example, the language in claim 18 is acceptable because the semiconductor layers must include an active layer.

Claim 5 is further rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 5 is a multiple dependent claim that depends from 3 different claims, and thus the claim must be clear and definite when depending on any of these claims. Presently, the claim refers to "the first concave portion". There is no "first concave portion" in either claim 1 or claim 2. The Examiner

Art Unit: 2828

recommends that in both claims 1 and 2 that the applicant refer to the concave portion of these claims as "a first concave portion".

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (previously cited US 6,239,033). Kawai discloses a device comprising a substrate 51, a semiconductor layer 52-59 including an active layer 56 and formed on the substrate 51, and one of a pair of electrodes 60,62 is formed on each of the substrate 51 and the semiconductor layer 52-59. There is inherently a current injection region because the device is electrically pumped. There is a groove 61 formed on the substrate on the side furthest from the semiconductor layer, said groove 61 reaching the depth of the semiconductor layer 52-59. The electrode 62 is formed on the surface of the groove 61. Kawai does not disclose that the structure is made of the materials as claimed. However, parts of a laser device are often made of the materials as claimed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the substrate of GaN and the semiconductor layer with a GaN base, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai as applied to claims 18-19 above, and further in view of Fujihara et al. (previously cited US 6,108,361). Kawai teaches the limitations of claims 18-19 as shown above, but does not teach that the groove is filled with a metal, specifically gold, where the surface of the groove is flattened and a heat sink is formed thereon. Fujihara teaches a substrate to a laser device that contains a concave groove thereon that is filled with gold and is flat. A heat sink is connected through the groove to the substrate of the laser device (see Fig. 7). It would have been obvious to one skilled in the art to connect the laser device to a heat sink so that heat release is improved, thus suppressing output saturation, as taught by Fujihara.

### *Response to Arguments*

Applicant's arguments, filed 13 June 2003, with respect to the rejections based on Kizuki (claims 1, 6-7, and 23), Fujihara (claims 1, 5, 7, and 23), and Yamamoto (claims 2-3) have been fully considered and are persuasive. These rejections have been withdrawn.

Applicant's arguments regarding the rejection of claims 18-21 are not persuasive. The Examiner maintains that the selection of a GaN substrate would have been an obvious design choice. The references cited in this action (Morita et al.; Takatani) disclose lasers having GaN based semiconductor layers formed on a GaN substrate.

Art Unit: 2828

***Allowable Subject Matter***

Claims 1-7 and 23 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. The following is a statement of reasons for the indication of allowable subject matter:

There is not taught or disclosed in the prior art a semiconductor laser device comprising semiconductor layers formed on a substrate, where either the substrate or the semiconductor layers have a groove (concave portion) formed therein, said groove being filled with a metal. As claimed, a groove in the substrate must extend completely through the substrate. Typically in the prior art, such a groove in the substrate that is filled with a metal does not extend completely through the substrate, and there is no suggestion of doing so. If such a groove does extend through the substrate, it will not be filled with a metal, but will only have a small layer of metal formed on the sides of the groove.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references show GaN based semiconductor layers formed on a GaN substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the

Art Unit: 2828

organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM  
July 22, 2003

  
PAUL IP  
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TECHNOLOGY CENTER 2800